

WINTHROP BEACH
MASSACHUSETTS

Prepared By

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CORPS OF ENGINEERS
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BOSTON, MASS.

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SUMMARY

1. Description. - The project consists of the restoration, improvement and stabilization of Winthrop Beach, in the town of Winthrop, Massachusetts, approximately four miles northeast of Boston. The shore area, included in the Winthrop Shore Reservation of the Metropolitan District Commission, a state agency, extends a distance of about two miles between Grovers Cliff on the north and Winthrop Head on the south. Construction of the project by the Commonwealth of Massachusetts is underway and is anticipated to be about 60% complete by fiscal year 1956.

2. Present Federal Cost Estimate. -

	Estimate
Construction	\$317,000 (1)
Lands (local responsibility)	0
Relocations	0
Engineering and Design	5,000 (2)
Supervision and Administration	18,000 (3)
Total	<u>\$340,000 (4)</u>

(1) Exclusive of \$634,000 to be expended by local interests

(2) " " 10,200 " " " " " "

(3) " " 35,800 " " " " " "

(4) " " 680,000 " " " " " "

(The Federal estimate includes \$37,000 for contingencies; the remaining cost, to be expended by local interests, includes \$74,000 for contingencies. The total estimate includes \$111,000 for contingencies.)

3. Funds

Alotted to date	0
Balance to complete	340,000 (1)
Total estimated cost (Federal)	<u>\$340,000 (1)</u>

(1) Exclusive of \$680,000 to be expended by local interests

4. Benefit-Cost Ratio. - 1.7 to 1.0

5. Status of Local Cooperation. - The Commonwealth of Massachusetts, since 1950, has appropriated over \$570,000 for the project, has followed all prescribed procedures and submitted all plans and specifications for prior approval by the Chief of Engineers.

6. Applicability of Provisions of Continuing Authorization Acts to the Project. - Not applicable.

TABLE OF CONTENTS

<u>SECTION</u>	<u>PAGE NO.</u>
A. AUTHORIZATION.....	1
B. LOCATION AND DESCRIPTION.....	1
C. PRESENT FEDERAL COST ESTIMATE.....	2
D. COMPARISON OF FEDERAL COST ESTIMATES.....	2
E. PROJECT CHANGES AND EFFECT ON COSTS.....	3
F. LOCAL COOPERATION.....	3
G. PROJECT BENEFITS AND ECONOMICS.....	4
H. STATUS.....	5

A. AUTHORIZATION

1. The shore protection project for Winthrop Beach provides for the most suitable method of preventing further erosion, stabilizing and improving the beach and protecting the seawall. Data concerning project authorization are as follows:

<u>River and Harbor Act and Document</u>	<u>Work Authorized</u>	<u>Estimated Federal Cost</u>
17 May 1950 HD 764/80/2	Raise and extend existing seawall, construct groins and widen beach by direct placement of sand	\$216,000

2. Full monetary authorization was provided in the Acts authorizing the project.

B. LOCATION AND DESCRIPTION

3. Winthrop Beach, a highly developed, densely populated, residential suburb of Boston, borders on Broad Sound and extends a distance of about two miles between two headlands, Grovers Cliff on the north and Winthrop Head on the south. The shore line of Winthrop Beach is included in the Winthrop Shore Reservation of the Metropolitan District Commission, a state agency, which comprises Winthrop Shore Drive, a seawall, and a narrow public bathing beach. The beach in its natural state was exposed to the full fury of North Atlantic storms. The southerly part of the area is protected by off-shore breakwaters. The beach is easily accessible from Boston, four miles distant, and its metropolitan area.

4. Pertinent Data. - The project provides for the following:

- a. Extend existing sea wall 400 feet.
- b. Raise existing sea wall 2 to 3 feet for a length of 1800 feet.
- c. Construct eight groins, aggregate length 2,300 feet.
- d. Direct placement of sand fill.

C. PRESENT FEDERAL COST ESTIMATE

ESTIMATE

5. Construction

(The estimate for construction includes \$37,000 for contingencies)

\$317,000

6. Lands. - Local responsibility.

7. Relocations. - None required.

8. Engineering and Design. -

\$5,000

9. Supervision and Administration. -

\$18,000

D. COMPARISON OF FEDERAL COST ESTIMATES

10. A comparison between the current estimate and estimates previously submitted is as follows:

	Total of Authorization Estimates (1947 Base)	Latest Estimate Submitted to Congress (1)	Present Approved Estimate (1954 Base)
Construction	\$201,000		\$317,000
Lands (local responsibility)	0		0
Relocations	0		0
Engineering and Design	3,500		5,000
Supervision & Administration	1,500		18,000
Totals	\$216,000		\$340,000

(1) No estimate submitted to Congress subsequent to estimate submitted for project authorization.

11. The net difference (increase) of \$124,000 between the present approved estimate of Federal cost and the authorization estimate is accounted for as follows:

(a) Difference between estimated Federal share and actual Federal share of completed work (Seawall Construction)	- \$10,000
(b) Increase in Federal share due to change in price levels (1947-1954)	45,000
(c) Increased yardage of sand fill required over that estimated in authorizing document due to further erosion of shore	71,000
(d) Increased quantities of stone for groins due to modified design (see Section E)	<u>18,000</u>
Total difference	\$124,000

E. PROJECT CHANGES AND EFFECT ON COSTS

12. & 13. There has been no change in the scope of the project since the latest plan submitted to Congress for project authorization. However, experience gained with groins already constructed by the Commonwealth of Massachusetts in the area indicated a desirability for a change in groin detail in order to obtain a more effective structure to retain the beach fill, placed under the project. The revised groin design will result in higher and wider, but shorter, structures requiring an additional 10,000 tons of stone, at an estimated additional cost of \$54,000, of which \$18,000 is the Federal share.

F. LOCAL COOPERATION

14. Requirements. - The project, authorizing Federal participation in the amount of one-third of the first cost of the protective and improvement measures, was adopted subject to the conditions that the Commonwealth of Massachusetts: (1) Adopts the plan of protection and improvement; (2) submits for approval by the Chief of Engineers detailed plans and specifications and arrangements for the prosecution of the new work of protection and improvement prior to commencement thereof; and (3) provides all necessary lands, easements, and rights-of-way; and provided further that the Commonwealth of Massachusetts gives satisfactory assurances that it will: (a) Maintain and repair the new work during its useful life as may be required to serve the intended purpose; (b) hold and save the United States free from any damage claims that may arise either before, during, or after prosecution of the work.

15. Estimated cost to local interests. - The share of the total project cost to be borne by local interests is estimated at \$680,000, or two-thirds of the total project cost, of which \$634,000 is for construction, \$10,200 for Engineering and Design and \$35,800 for Supervision and Administration. The estimate for construction includes \$74,000 for contingencies. In addition, local interests are required to maintain the project at an average annual maintenance cost estimated at \$11,000.

16. Status of local cooperation. - The Commonwealth of Massachusetts since 1950 has appropriated over \$570,000 for the project. The Commonwealth has followed all prescribed procedures, and submitted all plans and specifications for each feature of the project for prior approval by the Chief of Engineers.

G. PROJECT BENEFITS AND ECONOMICS

17. The benefits that will result from the construction of the shore protection structures consist of (1) prevention of direct damages to shore facilities, structures and adjacent properties; (2) prevention of indirect losses due to interruption of traffic and communications, the relief and care of storm victims and their rehabilitation and the general disruption of activities in the area; (3) increased land values and (4) increased usability of the beach resulting in increased earning power of property in the area. The completion of protective measures will provide an incentive to property owners to increase their investments through improvement of their land and structures, the net effect being a general improvement of the community.

18. The improvement area is publicly owned and publicly used for bathing by local and Boston residents within reasonable distances. Primarily, however, the beach area serves as protection for the highway, and for the residential development behind it. The configuration of the shore in this area is such that it is subject to much more severe wave attack than most of the coast, storms having a spectacular effect in the area. Waves hitting the seawall throw solid water and spray 50 feet or more in the air, and the accompanying winds blow water, sand and stones across the highway and damage houses in the area. In view of the urgency of the problem, the Commonwealth of Massachusetts has proceeded with the planning and construction of the project. The state has expended over \$500,000 for wall and groin construction and the placement of sand fill. The beneficial effect of the project was demonstrated during the recent hurricanes. Although the project was only partly completed, local observers and those interested in the project expressed approval of the success of the completed work in reducing the wave attack on the seawall.

19. Evaluation of project economics.

a. Average annual benefits

<u>Type</u>	<u>Amount</u>
Direct damages prevented	\$26,600
Increased land values	6,700
Recreational benefits (Increased rentals of adjoining private property)	35,000
Increased beach use	<u>12,500</u>
Total	\$80,800

b. Average annual charges

Investment

Federal	\$340,000
Non-Federal	<u>680,000</u>
Total Investment	\$1,020,000

Annual charges

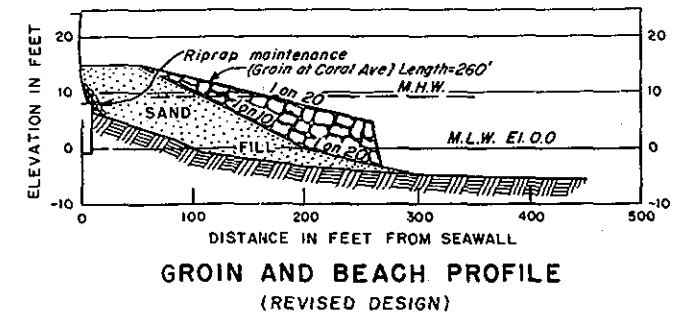
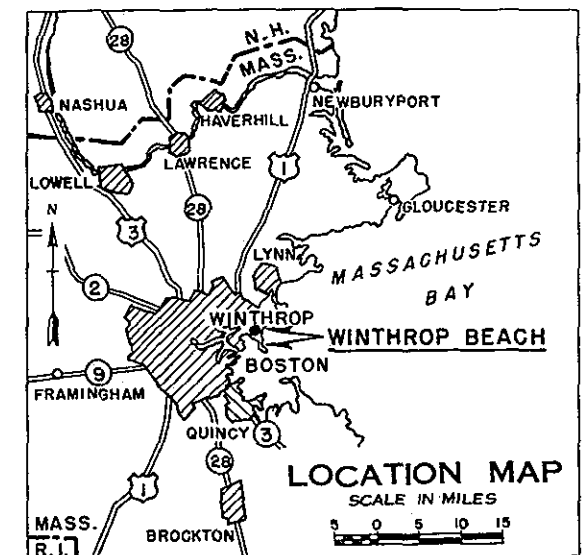
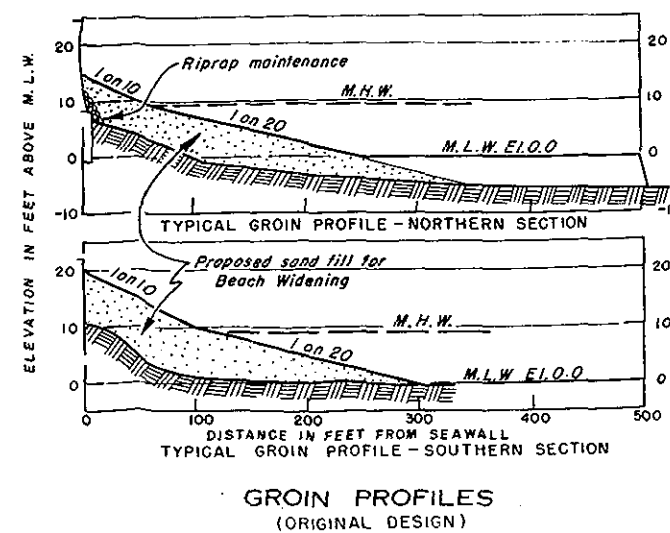
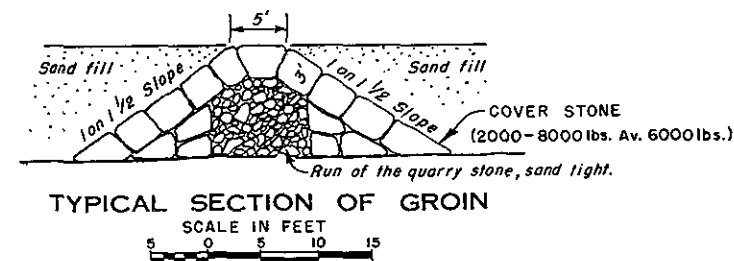
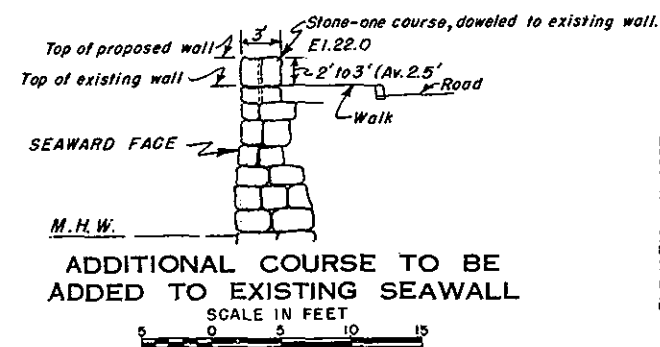
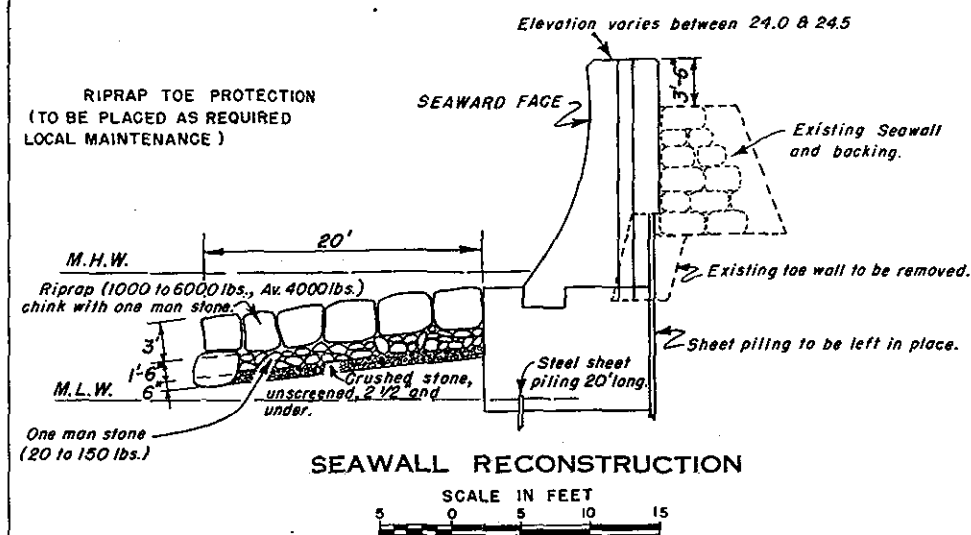
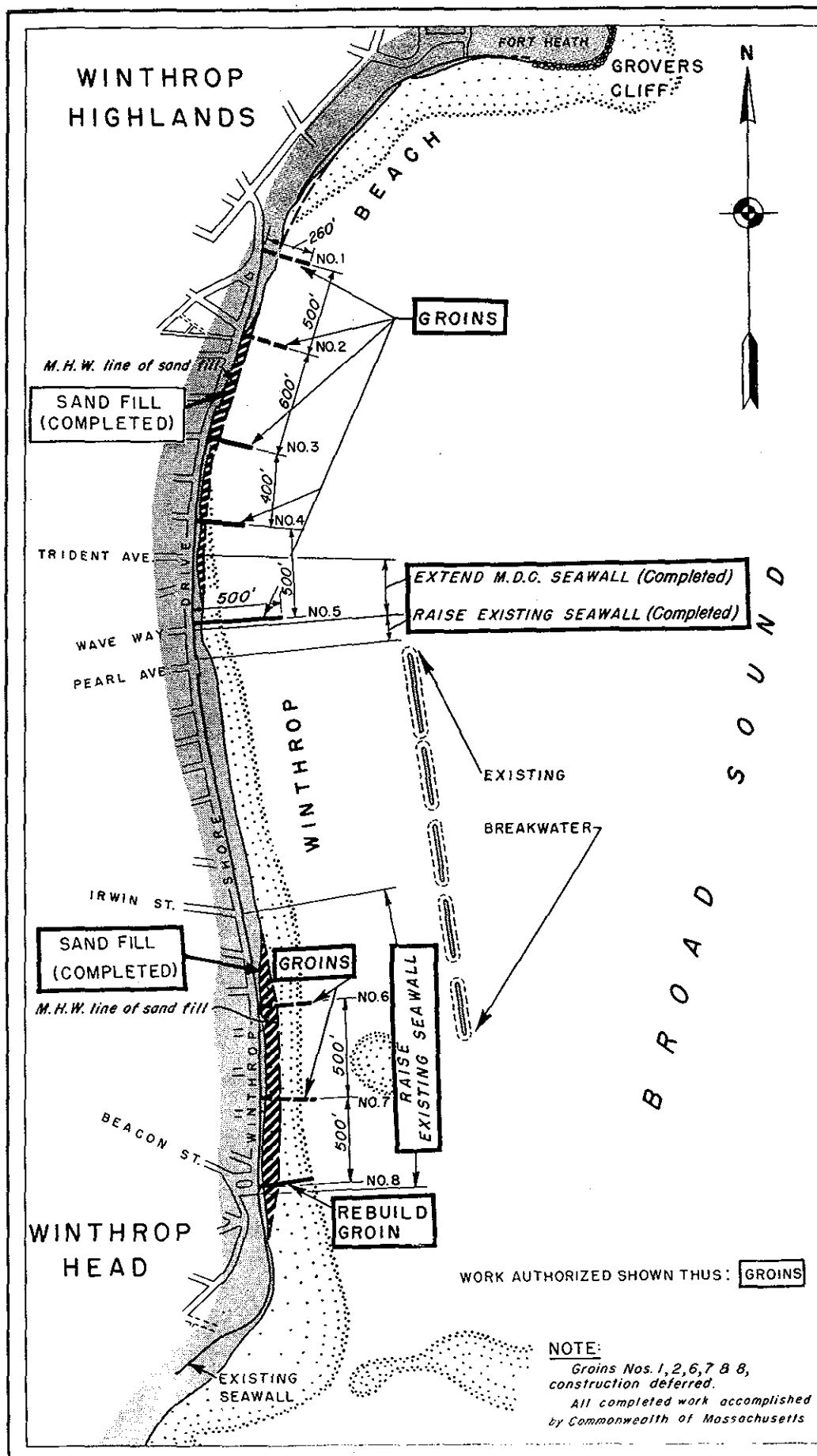
Interest and amortization (2 $\frac{1}{2}$ % interest - 50-yr. life)	\$36,000
Maintenance	<u>11,000</u>
Total Annual Charges	\$47,000

c. Benefit-Cost ratio 1.7 to 1.0

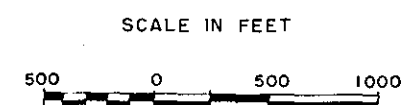
H. STATUS

20. Status of Planning. - All planning for the construction of the project with the exception of the work that has been deferred has been accomplished by the Commonwealth of Massachusetts.

21. Status of Construction. - The project is being constructed by the Commonwealth of Massachusetts in four stages. The first and second stages consisting of the seawall construction and the construction of three of the eight groins were completed by June 1954. Stage 3, completed during 1954, consists of placing sand fill by the hydraulic method. Stage 4, proposed to be completed in 1955, consists of placing stone topping on the seawall. The construction of the remaining five groins is deferred until experience indicates their necessity.



WINTHROP BEACH, MASS.



NEW ENGLAND DIVISION, BOSTON, MASS.

1 JANUARY 1955